Application No.:

10/530,789

Filing Date:

April 8, 2005

AMENDMENTS TO THE CLAIMS

1. (Currently amended) An arbutin ester compound represented by formula (1):

Formula (1)

wherein Ra is selected from the group consisting of: a hydrophobic group

R₁-CH=CH₂, wherein R₁ is a single bond, an alkyl group or an arylene group;

CH₃

 $R_1C = CH_2$, wherein R_1 is a single bond, an alkylene group or an arylene

group;

 R_1 -COOCH=CH2, wherein R_1 is a single bond, an alkylene group or an arylene group;

 R_1 -COOH, wherein R_1 is a single bond, an alkylene group or an arylene group;

 R_1 -COO- R_2 , wherein R_1 is a single bond, an alkylene group or an arylene group; and R_2 is an alkyl group or an aryl group;

 R_1 -[R_3 -CH=CH- R_4]_X- R_5 -CH₃, wherein R_1 , R_3 , R_4 and R_5 are each independently a single bond, an alkylene group or an arylene group; and X represents a number of repeating units and is 1 to 6;

 R_1 -C(CH₃)₃, wherein R_1 is a single bond, an alkylene group or an arylene group; and

 R_1 -CH₃, wherein R_1 is a single bond, an alkylene group or an arylene group. 2.-10. (Canceled)

11. (Currently amended): A composition that inhibits tyrosinase tyrosinase inhibitor comprising, as an active ingredient, at least one of the arbutin ester compounds according to claim 1.

Application No.:

10/530,789

Filing Date:

April 8, 2005

12. (Currently amended): An external preparation for the skin, comprising the composition tyrosinase inhibitor according to claim 11.

13. (Currently amended): A process for producing an arbutin ester compound, comprising the step of carrying out an esterification reaction of arbutin with a carboxylic acid compound represented by one of formulae (11) to (17) or formula (19):

Formula (11)

A-OCO-R₁-CH=CH₂

wherein A is hydrogen or a substituted or unsubstituted alkyl or vinyl group; and R_1 is a single bond, an alkyl group or an arylene group;

Formula (12)

$A-OCO-R_1-C(CH_3)=CH_2$

wherein A is hydrogen or a substituted or unsubstituted alkyl or vinyl group; and R_1 is a single bond, an alkylene group or an arylene group;

Formula (13)

A-OCO-R₁-COOCH=CH₂

wherein A is hydrogen or a substituted or unsubstituted alkyl or vinyl group; and R_1 is a single bond, an alkylene group or an arylene group;

Formula (14)

A-OCO-R₁-COOH

wherein A is hydrogen or a substituted or unsubstituted alkyl or vinyl group; and R_1 is a single bond, an alkylene group or an arylene group;

Formula (15)

A-OCO-R₁-COO-R₂

wherein A is hydrogen or a substituted or unsubstituted alkyl or vinyl group; R_1 is a single bond, an alkylene group or an arylene group; and R_2 is an alkyl group or an aryl group;

Application No.:

10/530,789

Filing Date:

April 8, 2005

Formula (16)

$$A-OCO-R_1-[-R_3-CH=CH-R_4-]_X-R_5-CH_3$$

wherein A is hydrogen or a substituted or unsubstituted alkyl or vinyl group; R₁, R₃, R₄ and R₅ are each independently a single bond, an alkylene group or an arylene group; and X represents a number of repeating units and is 1 to 6;

Formula (17)

A-OCO-R₁-C(CH₃)₃

wherein A is hydrogen or a substituted or unsubstituted alkyl or vinyl group; and R_1 is a single bond, an alkylene group or an arylene group;

Formula (18)

A-OCO-R₁-C₆H₅

wherein Λ is hydrogen or a substituted or unsubstituted alkyl or vinyl group; and R_1 is a single bond, an alkylene group or an arylene group;

Formula (19)

A-OCO-R₁-CH₃

wherein A is hydrogen or a substituted or unsubstituted alkyl or vinyl group; and R_1 is a single bond, an alkylene group or an arylene group.

- 14. (**Original**): The process according to claim 13, wherein the esterification is carried out in the presence of an enzyme catalyst.
- 15. (**Original**): The process according to claim 13, wherein the esterification is carried out in the presence of a chemical catalyst.
- 16. (**Original**): The process according to claim 13, wherein the esterification is carried out while performing a dehydration treatment.
- 17. (**Original**): The process according to claim 13, wherein the esterification reaction step is followed by the steps of:

Application No.: 10/530,789
Filing Date: April 8, 2005

extracting and isolating unreacted carboxylic acid derivative(s) from the esterification reaction mixture with a nonpolar organic solvent; and subsequently,

adding excess water to extract and isolate unreacted arbutin and to precipitate the arbutin ester compound.

18-36. (Canceled)

37. (New) The composition according to Claim 11, further comprising a suitable carrier.